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**AGRICULTURAL INSURANCE: APPROPRIATENESS  
FOR CARIBBEAN AGRICULTURE**

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SECTION I

INTRODUCTION

In 1978 the Department of Agricultural Economics and Farm Management (DAEFM), The University of the West Indies, mounted the first ever regional/international seminar on crop/livestock insurance schemes with particular focus on the Caribbean. The results of the seminar were widely disseminated and stimulated great debate on the feasibility of including agricultural insurance among that group of policy instruments designed to stimulate agricultural production and productivity, as well as to bring about structural changes in the agricultural system. The debate occurred at all levels - policy-making level, operational level, farmer/insurance carriers as well as among certain sections of the academic community. Shortly thereafter, the Agricultural Development Bank (ADB) in collaboration with Interamerican Institute for Cooperation on Agriculture (IICA) in Trinidad and Tobago mounted a one-day seminar to further explore some of the issues raised at the DAEFM seminar, particularly in relation to crop/credit insurance. Since then three other known activities took place in the Region.

- (a) A major producer organization, Windward Island Banana Producers' Association (WINBAN), showed interest in reviving insurance for banana farmers.
- (b) The Government of the Republic of Trinidad and Tobago commissioned an investigation on the feasibility of introducing an insurance programme on a pilot basis as part of a general feasibility study for agricultural insurance.
- (c) Recently two private insurance companies in Trinidad and Tobago have shown interest in actively pursuing the introduction of agricultural insurance to the farming activity and poultry.

In a more recent development, internationally (Dec. 1985), the issue of Crop Insurance and its appropriateness for developing economies was questioned in a rather comprehensive report prepared by the International Food Policy Institute, USA. This report suggests that even when crop insurance programmes are well managed, substantial subsidies are required. It also claims that most crop insurance programmes have not been successful from an economic standpoint. The report concludes by recommending that Governments "should look first to other types of assistance to reduce risk for farmers and protect

from income before they consider crop insurance."

The evidence so far suggests that "agricultural insurance" has not been a success story. However, such experiences cannot be used to draw inferences on the likely fate of agricultural insurance programmes as a rule. Most of the programmes have operated on very limited portfolios and coverage have often been restricted to the most risky assets of the farm-firm entity. This obviously does not lend itself to the establishment of actuarially sound programmes in agriculture.

This paper proposes a radical departure from the conventional approaches to agricultural insurance. The central element of this proposal is the expansion of agricultural insurance risk portfolio to include not only risk for crop and/or livestock, but also risk coverage for other farm assets e.g. life insurance for farm family, public liability, fire insurance for farm buildings - all as a comprehensive package.

#### ORGANIZATION OF THE PAPER

The subject matter of the paper is presented in four sections. The remainder of Section I provides some highlights on experiences with crop/livestock insurance in both developed and developing economies. In these discussions, particular reference is made to the Caribbean experiences which encompass both English and non-English speaking countries. Section II summarises in general terms, a review of some of the major categories of risks faced by Caribbean farmers. These include production, technological, market or price and policy risks. A critical appraisal of conceptual and operational issues in terms of risk management techniques used in the traditional design of insurance programmes is presented in Section III. In this section it is argued that more organic linkage between insurance companies, public or private, could under certain conditions lead to significant improvements in financial and economic viability. In this regard, it is postulated that a broadening of the portfolio of insurance companies to offer coverage to the farmer, his family, his assets. This evaluation highlighted some of the underlying structural problems, from the view point of risk management, in the design of such programmes. It is therefore not surprising that agricultural insurance worldwide have been characterised by generally poor performances. Section IV therefore attempted to identify structural changes in the design and modus operandi for agricultural insurance generally and with particular reference to the Caribbean. These changes which include broadening the traditional portfolio of insurance companies such as coverage to the farmer, his family, his assets - moving and fixed harmonization of premiums with income from farming, and public sector reinsurance programme should improve the actuarial soundness of these programmes.

A concluding statement appears in Section V.

#### EXPERIENCES IN AGRICULTURAL INSURANCE OF OTHER COUNTRIES

Agricultural insurance implies the elimination of risk for an individual farmer engaged in farming. These risks include crop and livestock production, machinery and equipment, buildings and farm-family. Risks associated with machinery and equipment, buildings and

life can normally be eliminated through normal insurance channels of private insurance companies.

Livestock insurance, one of the oldest forms of insurance has been practised in some form in most of the European countries. The main reasons for the development of livestock insurance in Europe in the past were due to the predominance of small farming using animal power and the initiative and efforts of Government in developing insurance at low cost organized through cooperatives and mutual societies. Outside Europe, attempts to underwrite livestock insurance have not succeeded. In Europe, the volume of livestock insurance operations had considerably declined. In North America, particularly Canada and the United States, there is very little insurance of farm animal against death or accident in general except as part of farm fire insurance.

Crop insurance has a relatively greater role to play in the agricultural economy of the developing and developed countries. Crop insurance can be classified into different types according to different criteria used. Classified according to the hazards insured against, it may be a specific risk, or a combined risk or an all-risk insurance. Classified according to the crops insured, it may be either single-crop insurance or multiple-crop insurance. Again, classified on the basis of administration, it may be public or private insurance. And finally on the basis of its scope and application, it may be voluntary or compulsory. An actual system of crop insurance could be a permutation and combination of all these criteria.

#### EXPERIENCES ACCORDING TO HAZARDS

##### Specific:

The most outstanding development in this group is the insurance of growing crops against the risk hail damage. Canada, Germany, Italy and Norway have voluntary insurance schemes designed exclusively to cover the risk of hail damage for all crops. Other specific hazards covered by insurance are for fire - sugarcane in Mauritius, windstorm - banana in Jamaica and drought - wheat barley in Cyprus. These are the only examples that were found in literature dealing with a single hazard. In West Germany, where hail crop insurance is supposed to have first started in the eighteenth century, total insurance written against hail in 1962 amounted to nearly DM1300 million and total premium receipts over DM14 million. In Canada in the province of Saskatchewan alone, 42,450 farmers had more than 8.5 million acres of crop or 36 per cent of the total crop acreage insured against hail damage. In the United States, the farmers have been increasing the amount of their insurance protection against the hail damage to crops.

##### Combined:

Combined insurance is an extension of hail insurance. Eleven insurance programmes were identified covering two hazards. Nine of these include hail and another hazard, six hail and fire and in the remaining hail was covered with rust, windstorm and frost. The other two combined programmes of fire and storm, and fire and lightning for selected crops are available in Germany and Italy where hail insurance is available for all crops.

#### All-Risk:

All-risk crop insurance, compared to specific risk insurance of crops is quite a recent development. In 1939, Japan and the United States started such insurance on national scale in respect of a limited number of crops as an experimental measure. It has since been practised in both countries though with considerable modifications particularly in the United States. Encouraged by its relative success in these two countries, a number of other countries have since also introduced it. There are at least 14 countries currently practising all- or multiple crop risk insurance. In some countries the all-risk crop insurance is operated on a national scale while in others it is in different stages of experimentation.

Of the different countries currently practising all-or multi-risk crop insurance, Japan has the largest programme. By 1960 as much as 94 percent of lowland paddy area, 52 percent of upland rice and 77 percent of area under wheat and barley were covered by insurance. The Japanese programme of crop insurance is in reality a combination of insurance and public relief. In the United States, the programme was launched on a national basis in respect of wheat only and cotton was added three years later. Due to heavy losses, the entire programme was discontinued in 1944 but was restored again in 1945 and flax was added as the third crop. At the same time provision was made for experimentation of other crops. Canada is a more recent entrant in the field on risk crop insurance. The first among the ten provinces to introduce such insurance was Manitoba in respect to wheat, oats, barley and flax.

Sri Lanka was the first developing country in Asia to have launched an all-risk insurance of paddy crop on a limited scale. Started in 1958, in respect of 26,000 acres, the experiment was extended by 1973 to 300,000 acres.

#### EXPERIENCES ACCORDING TO ADMINISTRATION

Earlier attempts by private companies to write crop insurances were short lived and were abandoned after incurring heavy losses by these companies. A few private companies do cover very specific hazards for crops. These companies can be found in Western Europe for hail and fire and in Mauritius for fire risk in sugarcane. However, most of the current crop insurance programmes have been established by the governments as an agricultural policy instrument. The actual administration of these programmes varies from country to country.

In Canada, crop-hail insurance is operated by rural municipalities, while all-risk insurances are operated chiefly at the provincial level. The reinsurance is carried out by Federal Government. The Federal Government bears part of the costs of administering the provincial programmes.

In the United States, the Federal Crop Insurance Programme has until now been operated by an autonomous governmental corporation located within the Department of Agriculture.

The entire agricultural insurance operations in Japan are administered by the insurance section of Economic Affairs Bureau, Ministry of Agriculture in close cooperation and assistance of the National Agricultural Insurance and Mutual Relief Associations. Government spends large sums to meet a part of the administrative expenses and also very substantial portion of premiums.

In Brazil, public crop and livestock insurance is operated by a

semi-governmental agency in the Commerce Department.

In Puerto Rico, coffee insurance was originally made available through the Coffee Insurance Corporation, but in 1950 the insurance functions were transferred to the Department of Agriculture and Commerce.

#### EXPERIENCES ACCORDING TO PARTICIPATION - COMPULSORY VS VOLUNTARY

A limited form of compulsory crop insurance against hail has been practised in Switzerland. Other instances of compulsory insurances are Paddy Crop Insurance Scheme of Sri Lanka and the Windstorm Insurance on bananas in Jamaica. In Sri Lanka, compulsory insurance of paddy crop in selected districts is carried on by a separate statutory body called The Agricultural Insurance Board, whereas in Jamaica, the banana insurance scheme is operated by a specially constituted Banana Industry Insurance Board.

In Japan, insurance is compulsory for farmers growing major field crops in all areas where Agricultural Mutual Relief Associations have been set up, provided the farmers satisfy certain designated standards.

A few other countries also have selected mandatory programmes. Another variant of this form is the system of all all-risk crop insurance in Mexico which makes it obligatory only for those farmers who apply for agricultural loans from government credit institutions.

The mandatory programmes have been able to achieve the desired objectives. However, the mandatory nature of the programme has produced recurring complaints from more efficient farmers about the equity of coverage and premium rates.

Voluntary programmes are by far the most important ones. Despite high subsidies farmers participation in crop insurance programmes has been relatively low. The participation in voluntary programmes has helped farmers to improve and stabilise their incomes but the participation and benefits have been stated by analysts to be skewed towards rich farmers.

#### MODIFICATIONS

As countries pursuing crop insurance programmes are gaining experiences they are modifying their programmes to suit their needs. Some of the notable modifications are:

- (a) coverage of increased number of risks, more crops and extended geographical area
- (b) raising of indemnities
- (c) introduction of no claim discounts
- (d) making the insurance obligatory when a subsidized interest loan is obtained from an official bank
- (e) coverage tied to the productivity of individual plots and premium rates linked more closely to local rates, and
- (f) volume (size) discounts.

#### HIGHLIGHTS OF THE REVIEW

The above review clearly reveals that:

1. All attempts by private companies in earlier years to write crop insurances were short-lived and were abandoned after incurring substantial losses by these companies.

2. A few private companies mainly in Western Europe are the only ones engaged in specific hazards hail and fire insurance.
3. All other crop insurance programmes have been supported by the governments. Public subsidies for a well developed programme like that in the United States average 25 per cent of indemnities; subsidies in Brazil and Mexico have been much higher being 50 and 80 per cent, respectively.
4. Due to the nature of the programmes which involves number of preliminary inspections and disaster and harvest inspection and administrative costs have generally been high, being about 6 per cent compared to about 1.5 per cent for life insurance.
5. All the specialized crop insurance agencies created by the States have limited portfolio - generally more risky.
6. The participation in voluntary programmes is relatively low.
7. Mandatory programmes which were designed mainly to achieve self-sufficiency in selected crops in some countries seems to have achieved the desired objectives.
8. In some countries voluntary programmes are mandatory for those farmers borrowing from official banks. This has resulted in marked improvements in the coverage of official loans.
9. Almost all programmes started small in respect of number of crops, number of risks and geographical coverage and were expanded later.
10. A few programmes after remaining in operation for several years were terminated mainly because of high costs of these programmes.
11. On the whole, insurance programmes have helped stabilize farmers' income and indeed has given farmers net increases in income.

## SECTION II

### RISK AND CARIBBEAN AGRICULTURE

Farmers engaged in agriculture in the Caribbean like their counterparts in other parts of the world face four major types of risks:

- (i) production risk
- (ii) technological risk
- (iii) market or price risk, and
- (iv) policy or institutional risk.

The major difference between the two groups of farmers is the degree of intensity of these risks and mechanisms available and utilized in the management of these risks. Risk management techniques adopted cover a wide spectrum. With respect to production risks, these vary from the traditional approach such as diversification, intercropping, crop rotation, the adoption of appropriate pest and disease control mechanisms, improvements in farm infrastructure and soil and water management techniques to innovative measures such as crop and livestock insurance schemes.

Because of the dualistic nature of Caribbean agriculture, the adoption of the above techniques is not universal and vary significantly among countries and between large and small scale farming activities. Except in cases where commodities are sold on the traditional export market at predetermined prices and occasionally where production takes place on contract, farmers face a great deal of

risk and uncertainty in the market place. The degree of price risk also intensifies when consideration is given to the fact that production, at least for the domestic markets is seasonal under normal conditions, and face the constant threats of massive flooding, hurricanes, storms and even volcanic eruptions which in recent times have devastated agricultural productions in Jamaica, Trinidad and Tobago, Dominica and St. Vincent.

Risk and uncertainty in agricultural production is largely responsible for differences and variation in income generated from farming activities in the Caribbean. Because of these low income levels or returns, it is well nigh impossible for the average farmer to rapidly adapt to new and changing technology that is designed to either increase production, productivity or reduce the cost of production.

The inability of the farming sector in the majority of the cases to lobby forcibly for consistency and some permanency in policies that affect agriculture, in itself constitutes a major constraints to sustained agricultural production. The sometimes sudden and unheralded removal of subsidies and other support from agricultural inputs used in key agricultural enterprises, or a sudden shift to export agriculture at the expense of domestic agriculture is certain to increase the riskiness for those who choose to remain in the latter. Similarly the divestment of key production infrastructural activities into private land e.g. planting material, livestock production units, have certainly exposed 'farmers' to higher levels of risk never before encountered.

To the above can be added change in the political environment and its impact on agriculture. A case in point is the situation where during the 1920s attempts were made to introduce large scale production commodities such as Irish potatoes, onions from the domestic markets and their subsequent abandonment and perhaps replacement by production of winter vegetables and exotica for the export market during the 1980s.

But many of the risks described above persists because of the relatively slow movement towards fundamental changes in the structure and mode of agricultural production and distribution. A large percent of the land resources in almost all of the Caribbean islands are either in large segments, concentrated on public or private lands and are yet to reach the hand of real agricultural producers; there is still a persistent insensitivity of certain financial institutions to the peculiar nature of agriculture even among those which claim public sector ownership. Farmers still find it difficult to purchase land to expand or consolidate their production activities; small core or entrepreneurs with an interest in agriculture and with linkage with other sectors of the economy, particularly the tourism sector. With respect to the latter, such a state of affairs continue to plague domestic agricultural production in the Caribbean. Much has been written and spoken about this situation but the response to change has been rather slow.

Notwithstanding the above, there are some hopeful signs which hopefully would reduce the riskiness of Caribbean agriculture. Some financial institutions are demonstrating an increased willingness to lend to farmers if they can demonstrate safe and sound markets, not just price, but price, quantity and quality guarantees. Some organic linkages are appearing in certain sectors such as broiler production



in which feed manufacturers are integrated with broiler operations and fast food outlets.

Because of improvements in the market condition, as a result of restrictions on extra-regional imports of certain commodities, a few pioneering farmers have introduced capital-intensive controlled environmental production techniques into production of vegetables and other commodities in Trinidad and Tobago and Jamaica. However, by and large, the results to date are far from encouraging because the impact of this intervention is on production and prices. The increase in numbers of these activities together with continued cultivation by traditional producers have served to push prices downwards to the extent to what were previously financially and economically viable operations have now become milestones around the neck of these pioneers.

Another important risk that is neither production, technological markets nor policy-related is that of praedial larceny. In almost every country in the Caribbean region, praedial larceny is reported to be on top of the list as far as crop/livestock losses are concerned. Legislation are on the books but there is yet to be developed an effective mechanism to deal with this problem of informal and unofficial distribution of farmers' produce.

### SECTION III

#### INSURANCE AND RISK MANAGEMENT

"Insurance is a social device which aims at reducing the uncertainty of loss through the combination of a large number of similar uncertainties and through the use of accumulated funds, distribute the burden of loss, should there be any, over space and time." (Ray: 22)

The above definition emphasizes the functional aspects of insurance. Firstly, insurance attempts to pool the uncertainties of loss of individual entities into mathematically measurable events. Viable insurance programmes therefore rely on wide participation in order to effectively pool risks. Events which are likely to lead to a loss whose outcome are uncertain from the viewpoint of an individual entity have a known probability of occurrence when considered over the relevant population. The probability of a single-event giving rise to losses being suffered by all entities in the population and probability of such wide spread loss over consecutive time periods should be low. In other words, losses should be so distributed spatially and temporarily so that the burden on individual entities is relatively small. Risk pooling and risk management are therefore central to the establishment of viable insurance programmes.

#### ISSUES IN THE DESIGN OF A SUCCESSFUL INSURANCE PROGRAMME

The theoretical concept of agricultural insurance as an instrument for risk management suggests a number of key issues or conditions which are necessary (though not sufficient conditions) for the establishment of a successful programme. Halcrow (pp.28,29) identifies five conditions:-

1. the insured should have an insurable interest in the object insured;
2. the risk to be insured must be sufficiently important to the insured;
3. the cost of insurance must not be prohibitive;
4. a large number of risks should be covered by the programme; and
5. the probabilities of indemnity must be capable of estimation in a mathematical sense.

#### INSURABLE INTEREST

Clearly, insurance programmes are designed to indemnify the insured for losses suffered and not for gain. The viability and integrity of a programme can suffer tremendously if opportunities exist for the insured making profits from insurance coverages.

With respect to agricultural insurance insurable interest have been traditionally defined in terms of production anticipated - either in whole or part. Indemnities and compensation for losses may be defined on the basis of a number of alternative specifications such as:-

1. estimated damage/loss to production (yields in the case of crop insurance and production/productivity in the case of livestock insurance);
2. the deficiency of yield/production from some insured level (e.g. 75% of average long-term yield); and
3. the investment in the particular production enterprise.

In order to avoid moral hazards of insurance, it is also important that the insurable interest should be such that it cannot be affected by the action of the party insured. In pursuit of this particular requirement, it is common practise for insurance programmes to exclude liability under certain contingencies. With respect to agricultural insurance in the Caribbean region, risk of losses arising from praedial larceny and fire, although real, can also be major moral hazards. Such contingencies if covered by a programme are likely to seriously jeopardize its viability.

The level of insurable interest is also critical in ensuring that the party insured does not affect the outcome i.e. losses. For example, where the level of indemnity is such that it is expected to exceed the revenue from sale of the produce, it is possible that this may encourage action on the part of the farmer to neglect his crop or livestock and thereby deliberately induce a loss.

The identification and delineation of insurable interest is therefore paramount to the design of a viable insurance programme. The problem is significantly more onerous for agricultural insurance compared to other types of insurance, particularly in the Caribbean context where farming is characterized by farms, many of which are small, spatially fragmented, with inadequate communication infrastructure and informal marketing channels.

#### IMPORTANCE OF THE RISK

The risk of insured must be sufficiently important both from the viewpoint of the insurance carriers and the insured. If the risk is not important to the farmer in terms of the probable magnitude of loss relative to farm income, there will not be the incentive to participate in the programme. This will in turn lead to high administrative cost relative to coverage thereby affecting the

viability of servicing the programme.

#### THE COST OF INSURANCE

The risk to insured must be sufficiently important both from the viewpoint of the insurance carriers and the insured. If the risk is not important to the farmer in terms of the probable magnitude of loss relative to farm income, there will not be the incentive to participate in the programme. This will in turn lead to high administrative cost relative to coverage thereby affecting the viability of servicing the programme.

#### THE COST OF INSURANCE

Unless programmes are mandatory, farmers will not participate in agricultural insurance programmes if the expected benefits are perceived to be less than the cost in terms of premiums. There are two components of cost:-

- (i) the administrative expense associated with servicing the programme; and
- (ii) the pure premium which is derived from the probabilities of paying indemnities.

With respect to the first, administrative expenses per contract will be high when the number participating in the programme is small and where the cost of servicing contracts high. These two factors are particularly relevant for agricultural insurance in the Caribbean. While the cost of servicing insurance contracts is normally high in agriculture because of the need to constantly monitor the crops/livestock, the spatial aspect of Caribbean farming is likely to further aggravate this problem.

With respect to pure premium, the data base necessary for actuarial analysis and computation of premium is most inadequate for the farming sector in the Region. This problem can lead to estimates of premium rates which are not sufficiently attractive for the farming community to participate in the programme.

#### NUMBER OF RISKS TO BE COVERED

As risks are spread among farms, both spatially within a country and regionally, prediction of total losses and therefore indemnities become more accurate. Variability of production within a small area generally tends to be greater than for a country as a whole or for a number of countries. The law of large numbers is particularly applicable in improving the predictive ability of an actuarial model. Having a large number of insureds, however, does not necessarily guarantee that annual indemnities will always fall within a close range of the annual premiums. There will always be those years when disaster is widespread such as that resulting from hurricane. Clearly in such a case, even a regional agricultural insurance programmes would need to pay out indemnities which in aggregate far exceed premium income.

The need to have a large number of insured is not only beneficial from the viewpoint of improving predictive ability with respect to indemnities but may also result in reduced administrative cost and a better spread of the burden of loss.

Within the Caribbean context increasing coverage of risks may necessitate spatial expansion across countries. The expansion of an insurance programme over a number of relatively small islands may not

necessarily lead to the economies in administrative costs as is normally anticipated. There are obviously diseconomies associated with servicing a programme which spans a number of small islands and thus careful examination would be required to assess the overall effect.

Risk coverage in Caribbean agriculture can span a wide range of crop and livestock activities. While the limited programmes which have been attempted in the Region (English-speaking Caribbean) have focussed principally on traditional exports, there is the scope to expand these to cover non-traditional export crops and domestic agricultural activities.

#### ESTIMATION OF THE PROBABILITIES OF INDEMNITY

Without the capability of estimating the probabilities of losses and indemnities, appropriate insurance premiums will of necessity have to be derived from guesses. The inherent danger of this approach is that premiums may be set at too low a rate in which case indemnities will tend to exceed revenue from premiums. The consequential revenue short-fall will therefore need to be financed from alternative sources. On the other hand when premiums are set too high, potential insureds are discouraged from participating in the programme. This in turn has its obvious impact on the viability of the programme.

It is obvious that agricultural insurance programmes, like other forms of insurance, must be actuarially sound in order to be successful. Unfortunately, the data base for agriculture in many countries, particularly in the developing world, is inadequate for such purposes. Often programmes start small with early experiences becoming valuable input in shaping future dimensions of programmes. The Caribbean Region is certainly no exception with respect to this problem of inadequate data base. Cautious development is therefore important in avoiding disastrous experiences.

The guidelines for the design and operation of insurance programmes which were discussed above do appear to be theoretically sound. Why then has many agricultural insurance programmes been unsuccessful, even within a social context? What changes are necessary in the approach to agricultural insurance which would improve their performance? These issues will be addressed in the section which follows.

### SECTION IV

#### TOWARDS A NEW APPROACH TO AGRICULTURAL INSURANCE

An examination of existing and past agricultural insurance programmes reveals weaknesses in the design and operational features which do not allow for viable performance. In particular, these programmes have not strictly followed the principles of insurance which requires that the number of risks to be covered should be maximized. Traditional programmes have been characterized by limited portfolios which are often the riskiest in the farming environment. This seems to be one of the major reasons for the generally poor performance of programmes.

Additionally, agricultural insurance have not been approached in a comprehensive manner in terms of addressing all the risk-coverage needs of the farm-firm as an economic unit nor have they tried to

build into programmes other features which can fulfil related needs of the farmer such as credit. The discussion in this section examines these departures, among other considerations, in proposing an alternative approach.

#### MODIFYING THE RISK-PORTFOLIO

Agricultural insurance programmes have traditionally restricted their risk portfolio to the coverage of growing crops or livestock. The various risks associated such "biological assets" were discussed in Section II of this paper. It is well-known that these risks are indeed high and therefore portfolio restriction to cover exclusively crops and livestock seriously jeopardizes the success of the programmes. Premiums would necessarily have to be high, if not subsidized, and losses to the insurance carrier resulting from high indemnity payments can be a regular phenomenon.

Not only is the risk of crop and livestock losses high to the individual farmer but also the probability of loss is not independent among insureds as is the case with other forms of insurance such as life, and fire. Because of the nature of the hazards involved, losses tend to be widespread. For example, losses from disease to animal or crop have a high probability of being widespread, affecting all farms in an area. Similarly drought, excess moisture and hurricane are hazards which affect production over extensive areas, in some cases covering several countries.

The probability of high indemnity pay out to a large proportion of insured in an agricultural insurance programme is to be expected because of the nature of the risk portfolio of the insurer. Clearly, there is very little prospect for survival under such conditions.

In consideration of the above, it seems necessary to make a bold departure from the traditional concept of agricultural insurance. In particular, it is proposed that agricultural insurance programmes diversify and expand their risk portfolios to include other risks on the farm which have conventionally been the domain of more traditional insurance. The risk coverage which may be incorporated into the programme include the following:-

- (i) fire and storm insurance coverage for farm buildings and the farm-family home;
- (ii) motor vehicle insurance for farm vehicles;
- (iii) life insurance for the farm-family; and
- (iv) insurance coverage for personal effects of the farm-family.

Indeed, agricultural insurance programmes which includes as wide a portfolio as that outlined above may be more appropriately called "farm insurance" since it seeks to address all the major risk coverage needs of the farm as a unit. It is obvious that in order for the programmes to be effective in realizing the desired objective the insurer must have the opportunity to service these needs in a comprehensive and integrated manner.

Diversification and widening of the risk portfolio of farm insurance programmes would therefore introduce the following positive effects in terms of improving the actuarial soundness and viability of programmes:-

- (i) the overall riskiness of the portfolio being managed would be reduced because of the introduction of lower risk activities. Thus probability of high payout of indemnities relative to premium income would be lower than the case

- where the portfolio covered only biological assets - crops and livestock; and
- (ii) the volume of insurance coverage (business per insured would necessarily increase since for each insured a greater number of assets will be provided with insurance coverage).

As a consequence of the foregoing, it would be expected that benefits would also accrue to the insured farmer. In particular, pure premium rates would be expected to decline because of the overall reduction in the level of risk of the portfolio. Also administrative expenses are likely to fall as a result of increased volume of transaction per insured farmer. The overall reduction in premiums charged to farmers would certainly provide incentive for increased participation in the programme. While the proposals advanced here may not make 'farm insurance' programmes commercially viable in this entirety, significant improvement in performances over that which currently obtains can be anticipated.

#### HARMONIZATION OF INSURANCE PREMIUM PAYMENTS WITH INCOME FROM FARMING

Operating an insurance programme which addresses all the risk coverage needs of the farmer allows the insurer to be more fully sensitized to the problems and peculiarities of farming. It is indeed an important prerequisite if the insurer wishes to customize insurance contracts to harmonize with the particular circumstances which obtain on the farm. One specific problem which farmers as economic entities face is the unevenness of cash flows from farming activities. It is therefore in full recognition of this fact that insurance contracts and premium payments should be appropriately structured. Such a harmonization of premium payment with cash flow makes insurance of farm assets, other than biological assets, a more attractive proposition. Farmers can therefore be expected to show interest in insurance coverage for those assets for which contingencies were desirable but were not affordable because of cash flow problems.

Harmonization of premium payments with farm income can also prove an effective strategy for the farm insurance carrier to penetrate the market of the traditional commercial insurance.

#### INSURANCE AND FARM CREDIT

As an economic entity, the farm unit is often in need of external financing to share-up own equity when investments are to be made or even short-term purchases of farm inputs and other goods. While there exists a number of traditional sources of finance for the farmer there have not all been within easy access.

Traditionally, insurance companies have been a source of credit/finance for their clients where endowment contracts have been in effect. The latter being used as collateral. It seems logical to extend this concept to farm insurance. Currently practised in a restricted form through crop/credit insurance, this concept can be extended to a farm insurance/credit type programme. There is insurance on biological assets (crops/livestock) together with life insurance (endowment) on the farm-family can provide the collateral for financing both agricultural production and non-production investment on the farm.

Such a feature of insurance will no doubt improve its attractiveness to the farming sector. Quite apart from facilitating production and the adoption of improved technologies through credit

availability such programmes will attract greater participation. The benefits of the latter have already been discussed.

#### MIXED-CAPITAL VENTURE

Because of the generally poor financial performance of many programmes they have not attracted much private participation. In the majority, commercial insurance have steered clear off agricultural insurance. Many programmes have therefore been operated by public sector entities. Accordingly, such programmes have had to invest heavily in the following:-

- (i) physical facilities
- (ii) expertise
- (iii) research
- (iv) field personnel.

Not being very experienced in the design and management of insurance programmes, many mistakes would have been made and many inefficiencies experienced by such public entities.

It seems logical and cost effective to have the operational aspects of a farm insurance programme housed within existing commercial insurance companies. In this way a significant proportion of the initial capital investment may be avoided by using existing human and physical resources. Further, the in-house expertise will be needed to service the insurance for the non-biological assets of the farm. Indeed, the major investments needed for the operation of a farm insurance programme is the acquisition of specialised expertise to deal with agricultural risks.

With reduced initial investment and possible reduced operational costs, with greater operating efficiency and improved management, the feasibility of farm insurance can be significantly enhanced. However, even this mode of operation may not guarantee a financially viable operating position since disaster are always real possibilities in agriculture. It is in this regard that the public sector has an important role to play in servicing farm insurance. To maintain farm insurance as a viable proposition to the private commercial firm, return to investment need to be maintained at levels commensurate with returns from other investment options. Accordingly, it is necessary for the public sector to provide additional reinsurance covering indemnity payments in excess of the maximum "affordable" level by private insurance. Such reinsurance can be provided either in-house by the public sector or can be purchased through commercial reinsurance firms.

Providing farm insurance through a mixed-capital venture as proposed above therefore recognises that:-

- (i) the existing private commercial firms with considerable investment in physical and human capital designed for servicing insurance are therefore best able to provide the most cost effective farm insurance coverages;
- (ii) the above does not necessarily guarantee commercial viability for private firms providing farm insurance because of the probability of disaster in agriculture;
- (iii) the public sector is probably better endowed to provide support to the programme when indemnities rise beyond the point where it is affordable by private insurance. Such reinsurance may be justified on social/economic grounds.

The above proposals, while providing the basis for a "farm insurance" programme which has the potential of improving the performance of agricultural insurance, must be supported with other measures to ensure actuarial soundness. In this regard, risk selection, crop/livestock selection and avoidance of adverse selectivity are some of the important considerations.

As a final note on improving the viability of agricultural insurance it should be noted that there is evidence in the Region of active participation by commercial banks in agriculture. This has facilitated growth and development and both sectors have been mutual beneficiaries.

The experience seems to suggest that mutual benefits may also be derived from a more organic link between the insurance sector and agriculture. By reinvesting into agribusiness and the agricultural sector, generally insurance companies can provide stimulation and development. This in turn generates additional business for insurance, thus improving the viability of a farm insurance programme.

## SECTION V

### CONCLUSION

In conclusion, it is our strong belief that agricultural insurance has a vital role to play to stimulate agricultural growth and to increase and stabilise farmers' incomes in the English-speaking Caribbean. Traditional approaches of crop and livestock insurance requiring substantial public subsidies are not likely to be affordable in the Region. Therefore, a new approach has been proposed. These proposals are based on a critical examination of the existing crop/livestock insurance programmes against theoretical/conceptual guidelines for the design and operation of successful insurance programme.

Specifically the approach outlined in previous sections consists of the following elements:-

- (a) diversification of the risk portfolio of agricultural insurance programmes;
- (b) harmonization of premium payments with farm cash flow;
- (c) linking of credit with insurance; and
- (d) private/public capital venture for the insurance carrier.

It is expected that a diversified portfolio will lower the overall portfolio risk enabling the programme to lower the premiums which will encourage increased participation resulting in higher volume of business. This in turn will lower administrative costs thereby improving the viability of the programme.

Harmonising of premium payments with crop/livestock production income and the provision of credit facilities will enhance further participation. Providing farm insurance through insurance carriers i.e. private capital/public capital venture can further improve the cost effectiveness of providing farm insurance. The proposed framework provides for limited participation by the State in the form of reinsurance which ensures that adequate incentives for private commercial insurance. However, these propositions though sound from a theoretical and conceptual point of view need to be validated with empirical data.



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